

## Non-Amphibious Batrachians

ON calling the attention of the Rev. L. Blomefield (formerly Jenyns) to the interesting article in *NATURE* (vol. xv. p. 491) of a tree-frog which produced its young without their passing through the tadpole stage, he has been good enough to allow me to quote a MS. note to his work, "Observations on Natural History," p. 203, which may be useful to persons interested in the matter. It refers to a colony of toads which lived in a cellar of Bottisham Hall, Cambs, and without access to water. It runs as follows:—

"See some remarks by Mr. Lowe in the *Annals and Magazine of Natural History* (No. 64, April, 1853, p. 341), tending to show that under certain circumstances where the parent animals have no access to water, the reproduction of the toad and frog takes place without the intermediate stage of tadpole. He mentions instances of their depositing spawn in cellars and young toads being afterwards observed. Such was probably the case with the toads in the cellars of Bottisham Hall, though I never observed the spawn myself." "See further remarks by myself on this subject in *Annals of Natural History*, vol. xi. 2nd series, p. 482. See also *NATURE*, vol. vii. p. 401, on 'The Adaptation of Animals to External Conditions.'"

The following passage occurs in the Rev. L. Jenyns's "Manual of British Vertebrate Animals," p. 304-5, and bears upon the same phenomenon.

"*Triton punctatus*, Common Eft.

"This species is subject to considerable variation. It is also found on land, a circumstance which tends in some degree to alter its characters. In such specimens the skin loses its softness becoming opaque, and somewhat corrugated. The membranes of the back and tail entirely disappear, causing this last to appear narrower and thicker in proportion to its depth. The toes from being flattened become rounded; the colours are also everywhere more obscure. In this state it is the *Lacerta vulgaris* of Sheppard and Turton, and considered as a distinct species by these and other authors. I am, however, perfectly satisfied that it is identical with the aquatic kind, and that all its peculiarities may be traced to the change of circumstances under which it is placed. . . . I suspect that the period of time during which this species remains in the larva state is subject to much variation, and that if anything occur to oblige the young to exchange their native element for another before they would attain their perfect form, the gills are cast prematurely to enable the animal to accommodate itself to its new circumstances. The fact of such small specimens as Sheppard has noticed being found on land is indisputable, but I think I have generally observed some traces of there having been gills at no very long period before."

GEORGE HENSLOW

## Morphology of "Selaginella"

IN consequence of my not having expressed myself sufficiently fully, Prof. Thiselton Dyer somewhat misapprehends my remarks respecting *Selaginella* and *Carex*, to which he is good enough to reply in *NATURE* (vol. xv. p. 489); and I shall be glad of an opportunity of explaining the nature of the comparison that I drew between the reproductive organs in these two genera.

I purposely avoided asserting that the spike of the one was the "homologue" of that of the other; and I thought that my change of expression—"instead of regarding . . . as the homologue . . . we compare it"—would sufficiently indicate that I was not raising the question of exact homology at all; but merely comparing the male and female structures of *Selaginella* (each as a whole) with those of a unisexual-flowering plant. I regret that I did not state this in explicit terms.

Notwithstanding what has been written by Sachs and others, it appeared to me that the homology between the reproductive organs of Cryptogams and Phanerogams could not be regarded as yet so completely settled as to be past doubt; and I therefore wished to exclude, as not material to the line of argument I had in view, such questions as to homology as Prof. Thiselton Dyer brings forward. He considers that the ovule, and not the ovary, is the equivalent of the macrosporangium. I did not wish, even by implication, either to assert or to deny this fact, and it does not affect my comparison in the least, for the female structure of *Carex* comprises of course an ovule. He further considers that this leaves the ovary unaccounted for; and not only so, but the perigynium and seta also. The essential part of a female flower is the ovule, which may be naked as in Gymnosperms; and the surroundings, whether consisting of an open carpellary leaf, an ovary, hypogynous scales, corolla, calyx, perigynium, or

seta are accessories, and any of them may be absent. A comparison may surely be made between the female flower of a conifer (as a whole) with the much more complex one of a diclinous polypetalous plant, without being vitiated by the fact that parts of the latter are unaccounted for; and I thought, and with due respect still venture to think, that the macrosporangium of *Selaginella* with its covering scale, and the female flower of *Carex* with its covering glume, may properly be regarded as comparable.

Prof. Thiselton Dyer had compared the sporangia of *Selaginella* with the male and female elements of a single hermaphrodite flower, reversing their relative position on the axis; and my object was to show that, as each sporangium had its own "lateral appendage," they might be equally compared with the male and female elements in the separate unisexual flowers of a diclinous plant, without reversing their position on the axis. It was quite unnecessary for me to discuss which particular parts of the phanerogamic flower were the exact homologues of the macro- or micro-sporangia of the cryptogam; and I did not intend to express any opinion on that subject.

I thank Prof. Thiselton Dyer for drawing my attention to his paper on *C. pulicaris*, which, however, I have already had the pleasure of perusing; for I read everything written by him to which I have access; and I can assure him that, as a non-professional myself, I always receive his opinions with the respect that is their due, although in the present instance I cannot adopt his view as to the hermaphroditism of the primordial flower. That subject is, I think, sufficiently important to be discussed by abler pens than mine; and it was in the hope that it would receive the attention that it deserves, that I ventured to point out the diametrically opposite views that had been expressed by high authorities.

THOMAS COMBER

Newton le Willows, April 11

## The Rocks of Charnwood Forest

THE announcement by Messrs. Bonney and Hill (*NATURE*, vol. xv. p. 470), of their discovery of the intrusive character of the ridge of rock, stretching from Groby on the south-east to Bardon Hill on the north-west, is a surprise to local geologists, they having recognised its intrusive character for the last quarter of a century.

The rocks constituting the "ridge" are called by different names—sienite, sienitic greenstone, greenstone, &c., according to the greater or less degree of crystallisation of the components, and the abundance, or scarcity, of some of them. Its intrusive character is very obvious. First we have Cambrian Rocks on both sides (east and west) of the "ridge," and at places near Groby these Cambrian rocks are less than half a mile apart. Second, the effect of the intrusion in breaking up the formerly overlying beds, is well seen near Markfield, where there are several low hills called the "Alter Stones;" these consist almost entirely of broken up fragments of unaltered Cambrian rocks embedded in a grey, coarse, felspathic base, the fragments forming more than two-thirds of the mass; similar beds occur beyond Bardon Hill, but the quantity of embedded fragments is not so great, but pieces are found eight to ten inches square quite unaltered, and showing the "ribbed" structure, red, purple, and green bands, so characteristic of the Cambrian rock of this area. Over other parts of this "igneous ridge" the broken and disturbed beds have long since been removed by denudation, but the debris is found in the "drift," which stretches far and wide for miles over the surrounding country. I think both Mr. Howell of the "Survey," who plotted this district, and Prof. Hull who did the adjoining one, recognised the intrusive character of the igneous rocks on the west side of Charnwood Forest. Many other facts bearing on this subject are known, but cannot be described in this short note. Any new facts discovered by Messrs. Bonney and Hill, in illustration of this matter, will be gladly received by local geologists.

Leicester

JAMES PLANT

## Patenas of Ceylon

I do not think Mr. Abbay's suggestion of a possible cause of the origin of the Ceylon patenas will be found to hold good to the extent he believes it will. On the *Dimbula* patenas rock of any kind is very scarce, even if you go several feet down, and where it does occur, it is, to the best of my recollection, almost always gneiss. On the patena on my property it is certainly so throughout. In part of the Ouvah patena district, mentioned by

Mr. Abbay, the rock is limestone, as is proved by its being largely quarried and burned. Moreover, the patena soil in Ouvah is not of the ordinary worthless quality, at any rate in the opinion of planters owning portions of it, as they frequently assert that it is as good as the jungle soil of Dimbula, and the neighbouring districts. What truth there is in this I cannot say.

Further, though cleared forest land when abandoned usually runs into "chena," I could show Mr. Abbay, if he were to return to Ceylon, as I wish he would, cases in which it has run into patena. The Dimbula cricket ground is a case in point.

Pendleton, Manchester, April 17

E. HEELIS

### Cumming's Electricity

IN a passage from my "Introduction to the Theory of Electricity" which you quote in a review of the work in *NATURE*, vol. xv. p. 526, occurs a very unfortunate misprint of the word *of* for the word *on*, which seems to have misled your reviewer, and I therefore beg a few lines to correct it. The passage in question is the statement of Prop. 8, p. 203, which ought to have been written: "In computing the potential on any closed circuit we may substitute for it any closed circuit which is obtained by projecting the given circuit by means of lines of force."

In defence of this phrase I may perhaps be allowed to point out that the definition of potential quoted by the reviewer as that of Sir William Thomson is not the definition of potential but of *electrostatic potential at a point*, which is given at p. 45 of my book. The phrase potential on an electrified body in a field of electrical force is, I hold, perfectly legitimate, denoting the work done against electrical forces in moving the body (supposing all electrification undisturbed by the movement) to an infinite distance out of the field.

The case in point, however, refers to electro-magnetic potential and the potential on the closed circuit really represents the work done in carrying the circuit against magnetic forces out of the magnetic field.

The phrase suggested in your review—induction through the circuit—I had purposely avoided as liable to be confused with ordinary "magnetic induction" in a mass of magnetic iron, or with the "self-induction" of the circuit, or even with the induced current produced by the movement of the circuit, while the phrase potential on the circuit is at once suggestive of its own meaning and clear from any ambiguity.

Rugby, April 19

L. CUMMING

### Remarkable Papuan Skull

I WISH to call your attention to a remarkable Papuan skull which Prof. Mantegazza showed at the last meeting of the Anthropological Society of Italy. The upper jaw contained very distinctly no less than four molars and two canine teeth on each side, all the molars being well developed.

Unfortunately the lower jaw is missing, but if it corresponded with the upper jaw, as we may justly presume—the whole skull not showing any abnormality of structure—the total number of teeth would amount to *forty*. There are cases recorded of negro-skulls showing three, four, and five supernumerary teeth, but *eight* is certainly an *extremely rare* occurrence.

It would be interesting to know whether museums or collections in England contain any similar specimens. J. E. Z.

### Meteor

ABOUT 10.50 P.M. on the night of Monday, the 16th inst., the sky being cloudless and the young moon just setting, I observed a remarkable meteor in the northern heavens. It originated near to the star  $\gamma$  Cephei, and travelled towards the eastern horizon, its path forming an angle of about  $35^\circ$  with the perpendicular. The head, two or three times as large and bright as Venus, was bluish, and left a trail of yellowish light. I took it at first for a falling rocket, whose ascent I had not noticed; but its transient existence, its sudden extinction without noise or sparks, and the straightness of its path, with only a slight zig-zag, but no curve, preclude that explanation I think.

Leicester, April 17

F. T. MOTT

### OUR ASTRONOMICAL COLUMN

THE U.S. NAVAL OBSERVATORY, WASHINGTON.—Under the title "Instruments and Publications of the United States Naval Observatory," the superintendent has circulated a series of

photographs of the instruments at present in use in that noble astronomical institution. They are taken by the heliotype process, and comprise (1) the mural circle, mounted in 1844, aperture 4'1 inch; the transit instrument, 5'33 inch aperture, mounted in the same year, and placed in the same room beside the mural circle; the smaller equatorial, mounted in 1844, with which so much good work has been performed, aperture 9'62 inch; the transit-circle, by Pistor and Martins, Berlin, which was mounted in 1866, the aperture of the object-glass 8'52 inch, and the focal length 12 feet 1 inch; a general view of the grand 26-inch refractor, of 32 feet 5'8 inch focal length, mounted in 1873, and one of the most powerful telescopes in the world; the clock-work, &c., of this magnificent instrument is shown on a separate plate. Brief descriptions accompany these heliotypes, and in addition are drawings made with the 26-inch equatorial of the nebula in Orion, the omega nebula, the annular nebula in Lyra, and the planet Saturn. Some account of the foundation of the observatory and a list of its publications from 1845-76 precede the brief description of the instruments of which views are presented.

NEW VARIABLE STAR.—A recent number of M. Leverrier's *Bulletin International* contains a notice from MM. Henry respecting a variable star in Virgo, which they state has been under observation for some time. The period is about seven months, and the limits of variation 8m. to 14m.; at present it is near a maximum. The position for 1877'0 is in R.A. 12h. 27m. 32'2s., N.P.D.  $93^\circ 44' 37''$ .

EARLY OBSERVATION OF SOLAR SPOTS.—In our popular astronomical works the Chinese are not usually credited with the observation of spots upon the sun at a distant date. Gaubil, however, records from the Chinese annals that on May 7, 826 black spots were seen on the sun's disc, and again on April 21, 832. There are, indeed, few phenomena which are not noted by this observant people, or rather by their watchful astronomers; yet, strange to say, the zodiacal light is amongst them. And it is singular that while Kepler's star of 1604 is duly recorded, the Chinese annals have no reference to the similar object in 1572, with which the name of Tycho Brahe is commonly associated.

COMET 1877 III.—The comet discovered by M. Borelly at Marseilles, on April 14, appears to have been detected three or four nights earlier by Mr. Lewis Swift, of Rochester, New York, who is already the independent discoverer of more than one of these bodies. We say three or four nights earlier, for although the telegram forwarded to Europe through the Smithsonian Institution dates the observation on the night of April 11, the rough place there assigned agrees more nearly with the computed position for the previous midnight. In circular No. xxv. of the Imperial Academy of Sciences at Vienna, are elements by Dr. Holetschek, from the first three nights' observations, which it is remarked have "a very great resemblance to those of the comet of the year 1762." The following orbit has been calculated by Mr. Hind from the first complete observation at Marseilles, on April 14, one at Mannheim by Prof. Schönfeld, on the 16th, and a third at the observatory of Mr. J. Gurney Barclay, at Leyton, on the 19th. For the sake of comparison the elements of the comet of 1762, calculated by Burckhardt, after a new reduction of the Paris observations, are annexed.

	COMET 1877 III.	COMET 1762.
Perihelion Passage (G.M.T.) ...	April 26'9501	May 28'3345
Long. of Perihelion ... ..	$102^\circ 45' 51''$	$104^\circ 2' 0''$
" Ascending Node ... ..	$345^\circ 53' 18''$	$348^\circ 33' 5''$
Inclination ... ..	$77^\circ 8' 56''$	$85^\circ 38' 13''$
Perihelion Distance ... ..	1'01089	1'00905

The motion is direct. It will be remarked that the only material difference is in the inclination of the orbits to the ecliptic. The comet of 1762 was discovered in the Netherlands, by Klinken-